

REMARKS

Reconsideration of the present application is respectfully requested.

Claims 1-26 stand rejected under 35 USC §112 because they supposedly contradict themselves. Applicant respectfully disagrees, and respectfully asserts that the rejection appears to be based upon a misinterpretation and/or a dismissal of Applicant's claim language. Applicant respectfully asserts that the claims mean what they say. In other words, Applicant's claimed heating strategy drives the piezoelectric actuator at such a high frequency that the actuator can not respond mechanically by a displacement of a magnitude associated with a normal operating frequency. Those skilled in the art would appreciate that Applicant's claims are directed, at the microscopic level, to vibrating an ion in the lattice structure of the piezoelectric material too rapidly for the lattice structure to respond with a deformation of a type associated with a displacement at a normal operating frequency. When driven in the claimed manner, the internal vibrations within the lattice structure cause a heating but little or no movement of a type that would be associated with a displacement actuation of the piezoelectric actuator. An example application of the claimed invention could be to a fuel injection system at cold start that utilizes piezoelectric actuators. For instance, while the engine is undergoing cold start cranking, the piezoelectric actuators can be driven in the claimed manner to excite an electrical resonant frequency to cause the piezoelectric actuators to heat up to a more preferred operating temperature without risk of accidentally injecting fuel during the heating procedure due to a substantial displacement of the piezoelectric actuator. The heating process may typically last on the order of maybe two seconds. Thus, Applicant respectfully asserts that when the submitted claim language is interpreted consistent with the written specification, as it must be, that the claims are entirely definite. Therefore, Applicant respectfully requests that the outstanding §112 rejections be withdrawn.

In an effort to avoid having Applicant's claim language misinterpreted, Applicant has amended the claims to make clear what has been implicitly a part of the claims since the original filing. In other words, a reader need no longer look to Applicant's written specification to correctly interpret what the term electrical resonant frequency means in the context of the claimed invention. In addition, the claims now make explicitly clear relative terms that became part of the explicit claim language in the previous amendment. In particular, Applicant's claims

make it clear that the electrical resonant frequency is significantly higher than a normal operating frequency associated with a displacement actuation event of a type well known in the art. These amendments do not alter the claim scope, but merely make explicitly clear features that have been implicitly an aspect of the claims since originally being filed. Therefore, Applicant respectfully requests that the amendments be entered, and that the §112 rejections again be withdrawn.

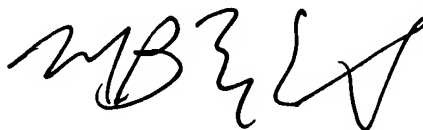
Claims 1-9, 13-22, and 26 stand rejected under 35 USC §102(a) over Takahashi, Tanabe, Katasha or Suzuki. Applicant respectfully disagrees since the MPEP requires that a reference show exactly what an Applicant has claimed in order to support a rejection under 35 USC §102. In this instance, it appears that Applicant's claims have been stripped of any intended meaning and interpreted as merely claiming the concept of driving a piezoelectric actuator at different frequencies that may be temperature related, as supposedly taught by the cited art. However, that is not what Applicant has claimed. On one hand, it does not appear as if any of the cited art recognizes that a piezoelectric actuator can be self heated by control signals at significantly higher frequencies than normal operation frequencies of the type discussed in the cited art. Thus, Applicant respectfully asserts that there is no fair interpretation of Applicant's claim language that would allow them to be misread onto the cited references. Because Applicants claims define a heating strategy for piezoelectric actuators that is neither shown or suggested in the cited references of record, Applicant respectfully requests that the outstanding §102(a) rejections be withdrawn.

Claims 10-12 and 23-25 stand rejected under 35 USC §103(a) over Takahashi, Kataska or Suzuki. The office action then goes on to dismiss Applicant's included wherein clause as supposedly not adding any structural limitation to the apparatus. Again, Applicant respectfully disagrees. In the first office action, Applicants claim language directed to an electrical resonant frequency was apparently ignored. Therefore, Applicant added the wherein clause in the previous office action response in order to make more explicitly clear in the claim itself what this term meant. However, this limitation was again dismissed in favor of an unfair mischaracterization of the claim language as supposedly reading on the art of record. Since it does not appear as if Applicant's claims have yet been fairly examined, Applicant again must respectfully request that the claim amendments be entered, that the claims be fairly interpreted, and that they be examined on the merits. Thus, Applicant asserts that the claim amendments not

only put the application in better condition for appeal, but actually put the application in condition for allowance. Therefore, because the cited references can not be fairly interpreted as showing or suggesting the claimed electrical resonant frequency aspect of the claimed invention in order to accomplish heating without displacement actuation as per Applicant's claims, Applicant respectfully requests that the outstanding §103(a) rejection be withdrawn.

This application is now believed to be in condition for allowance of claims 1-26. However, if the Examiner believes that some minor additional clarification would put this application in even better condition for allowance, the Examiner is invited to contact the undersigned attorney at (812) 333-5355 in order to hasten the prosecution of this application.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'MB McNeil', with a stylized flourish at the end.

Michael B. McNeil

Reg. No. 35,949